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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,345	11/14/2001	Takeshi Konno	107443-00014	6928

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EXAMINER	
FONTAINE, MONICA A	
ART UNIT	**PAPER NUMBER**
1732	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/987,345	KONNO, TAKESHI
	Examiner	Art Unit
	Monica A Fontaine	1732

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed 1 September 2004.

The rejections of Claims 5-8, and 10-12 STAND as stated in the paper mailed 1 May 2004.

The rejection of Claim 9 under 35 USC 103 in view of Imatomi (US 6321940) has been withdrawn.

The rejections of Claims 1-4, 9, 13, and 15-17 have been withdrawn as necessitated by applicant's amendment. New rejections of these claims are listed below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 4,879,077), in view of Yamazaki (U.S. Patent 4,540,359), as stated in the paper mailed 1 May 2004.

Claims 1-4, 9, 13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 4,879,077), in view of Akira (JP 61-121921).

Regarding Claim 1, Shimizu shows the basic process, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, lines 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the screw (Figures 3-5; Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary synchronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it (Abstract). Akira and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 2, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 3, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, lines 60), comprising the steps of, defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the screw (Figures 3-5; Column 2, lines 58-65), and defining a

rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 4, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 9, Shimizu shows that it is known to control an injection molding machine in order to control the movement of a molten resin in a heating cylinder of the injection molding machine (Column 2, lines 18-26), the injection molding machine including a screw arranged within the heating cylinder to be rotatable and to be linearly movable (Column 2, lines 43-48) and having a flight of pitch P (Column 2, line 51), the molten resin being moved in a forward feeding direction during a plasticization process and an injection process (Column 2, lines 43-65). Shimizu does not show rotating the screw while moving it backwards after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it at a rotation speed (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 13, Shimizu shows the basic process as claimed, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), moving molten resin in a forward feeding direction during a plasticization/measuring process and an injection process (Column 2, line 60), and rotating the screw in the feeding direction at a rotation speed R (Column 2, lines 45-49) and simultaneously linearly moving the screw at a constant speed V (Column 2, lines 48-51). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward

speed while rotating it, wherein the rotation speed of the screw is controlled in correspondence to the constant backward speed of the screw (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 15, Shimizu shows the process as claimed as discussed in the rejection of Claim 13 above, including a plasticization/measuring process and an injection process (Column 2, line 60), wherein the rotation speed R of the screw is given, by defining a synchronization ratio based on the backward speed of the screw and the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized.

Regarding Claim 16, Shimizu shows the process as claimed as discussed in the rejection of Claims 13 and 15 above, including a method wherein the selected rotation speed is given by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized.

Regarding Claim 17, Shimizu shows the process as claimed as discussed in the rejection of Claims 13 and 15 above, however Shimizu does not explicitly show variations of the

synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (thus dragging resin backward) and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw (thus feeding resin forward). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized (causing no movement to the resin).

Response to Arguments

Regarding Claims 5-8 and 10-12, applicant's arguments filed 1 September 2004 have been fully considered but they are not persuasive. Although applicant contends that these claims include the step of moving the screw at a constant backward speed, there is no such actual method step. Although the synchronization ratio is calculated using constant linear backward speeds, it is not claimed that the screw moves at a constant linear backward speed when the screw moves "at a selected synchronization ratio". In the case of these claims, the "constant linear backward speed" only alters how the defining of the synchronization ratio is calculated. It is maintained that it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are

perfectly synchronized, i.e. when the position of the flight does not move relative to a constant backward speed of the screw.

Applicant's arguments with respect to claims 1-4, 9, 13, and 15-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A Fontaine whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maf
November 29, 2004

MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER